

***GLAST Calorimeter***

---

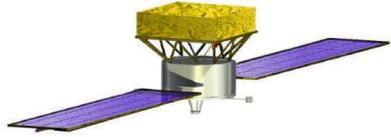
*Video Conference  
4 March 1999*

# GLAST Calorimeter Status 4 March 1999

W. Neil Johnson  
Naval Research Lab

Naval Research Lab  
Washington DC





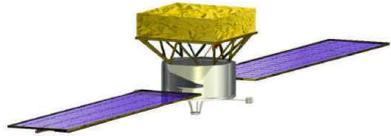
## **GLAST Calorimeter**

# Procurement Status

Video Conference  
4 March 1999

- ❑ PIN Photodiodes - Hamamatsu
  - All PIN diodes arrived at NRL on 2/19/99
  - In acceptance testing
- ❑ CsI Crystals - Ukraine
  - Received 4 31-cm crystals, 2 40-cm crystals on 2/2/99
  - All other crystals (46 31-cm and 8 40-cm) have been completed and are in testing in the Ukraine. They will be turned over to the State Dept for shipping this week.
  - Ukrainian visit to NRL scheduled for Mar '99 after arrival of crystals.
- ❑ CsI Crystals - Crismatec
  - No material in hand except for test articles.
  - First 4 crystals to be shipped by 3/15/99
  - Next 16 crystals to ship 4/14/99
  - Final 20 crystals to ship 4/30/99





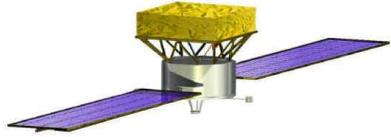
## **GLAST Calorimeter**

# CsI Testing and Development

*Video Conference  
4 March 1999*

- ❑ BaBar Crystal test equipment has been modified for dual PMT measurements.
  - Hamamatsu R5900 PMT on both ends,
  - Dual ADC data acquisition system supporting both list and histogram modes.
- ❑ Fixtures for epoxy of PIN diode to CsI has been fabricated.
  - Controls mechanical alignment of PIN on CsI
  - Process 6 crystals simultaneously (24 hour curing required)
- ❑ Tetratek wrap has been received: 0.010" thick material
- ❑ Vendor has demonstrated lamination of Tetratek and mylar with silver reflective coat. Sample quantity on order.
- ❑ Completed assembly of 3 wire chambers for muon telescope. Two more anode planes are being wired. Two chambers are needed for each telescope.





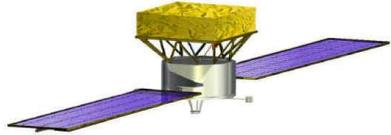
## **GLAST Calorimeter**

# Beam Test Calorimeter

Video Conference  
4 March 1999

- ❑ Hytec is under contract to fabricate two compression cell units.
  - Machined parts are being manufactured, ~1/3 complete, on schedule.
- ❑ Prototype front end PCB design and layout complete.
- ❑ Calorimeter controller board has been designed. ICD details are being worked with DAQ engineers.
- ❑ Problem has been identified with implementation of current cal-only trigger - propagation delay too long. New concept is proposed (later chart).
- ❑ Organization and nomenclature for CsI log identification and data ordering has been created.





## **GLAST Calorimeter**

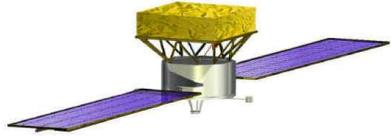
# CsICal ASIC Development

Video Conference  
4 March 1999

- ❑ Testing is progressing at GSFC and NRL on CsICal2-2 ASIC. All results to date look good.
- ❑ I2V/V2I ASIC arrived at GSFC on 2/26. Bonding and testing is in progress.
- ❑ Current plan is to submit corrected designs to SuperTex (new owner of Orbit) by 3/15/99. A production run is planned with 3 designs included:
  - Modified CsICal2-2, fix missing via on GTOff signal (Primary design)
  - CsICal2-1, tested and functional as is except for missing discriminator via that is not needed for beam test. (Fall back, known working design)
  - I2V, modified, if necessary, based on current testing.

This plan breaks the budget, but the better response time for production run is critical to meeting beam test schedule. Quote is 6 - 8 weeks.





## **GLAST Calorimeter**

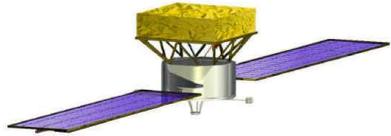
# Calorimeter Schedule

*Video Conference  
4 March 1999*

Critical path to Beam Test is through ASIC fabrication and test. (Two months behind original schedule due mostly to Orbit problems.)

- Reliable delivery (we hope) requires production fabrication run at SuperTex, cost ~ \$25 - 50K
- Mounting ASICS on FEE PCB begins 6/21/99
- Assembling FEE PCB and Detectors begins 7/12/99
- I&T begins 7/26/99
- Pack and ship to SLAC, arriving 9/15/99





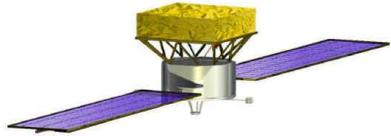
## GLAST Calorimeter

# Cal-Only Trigger

Video Conference  
4 March 1999

- ❑ Current cal-only trigger is defined as 3 or more crystals with  $>100$  MeV.
  - This requires, essentially, 40 sequential 1-bit sums with carry.
  - Worst case propagation delay of  $\sim 320 - 400$  nsec.
  - Dangerously close to the  $1 \mu\text{sec}$  response requirement for tracker when pulse rise time delays are included.
- ❑ Bernard's alternate proposal: 3 in a row - it works for tracker, why not the calorimeter.
  - "Or" fast triggers by calorimeter layer.
  - Trigger on selected combinations of at least 3 consecutive layers.
  - Optionally, "And" or "Or" signals from opposite ends of the logs.
  - For beam test, propose implementing this version of the cal-only trigger.





## **GLAST Calorimeter**

# Management Issues

*Video Conference  
4 March 1999*

- ❑ Agreement in principal on French/Swedish participation in calorimeter development.
  - French design and fab mechanical housing of calorimeter crystals. Baseline is Hytec design (for proposal). Fleury's design will be studied this spring/summer and may become baseline. Regardless of final design, French are responsible for the mech fab.
  - French will design, qualify, fab and package analog ASICs for the calorimeter.
  - French will procure and test PIN photodiodes.
  - NRL will design, fab all electronics, assemble calorimeters, provide required software and GSE, and support all I&T>
- ❑ Detailed WBS outlining responsibilities has been created and is being reviewed.

